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(54) **EXPEDITION CARTS AND ASSOCIATED SYSTEMS AND METHODS**

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CPC ..... *B62B 1/125* (2013.01); *B62B 2501/00* (2013.01); *Y10T 29/49622* (2015.01)  
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See application file for complete search history.

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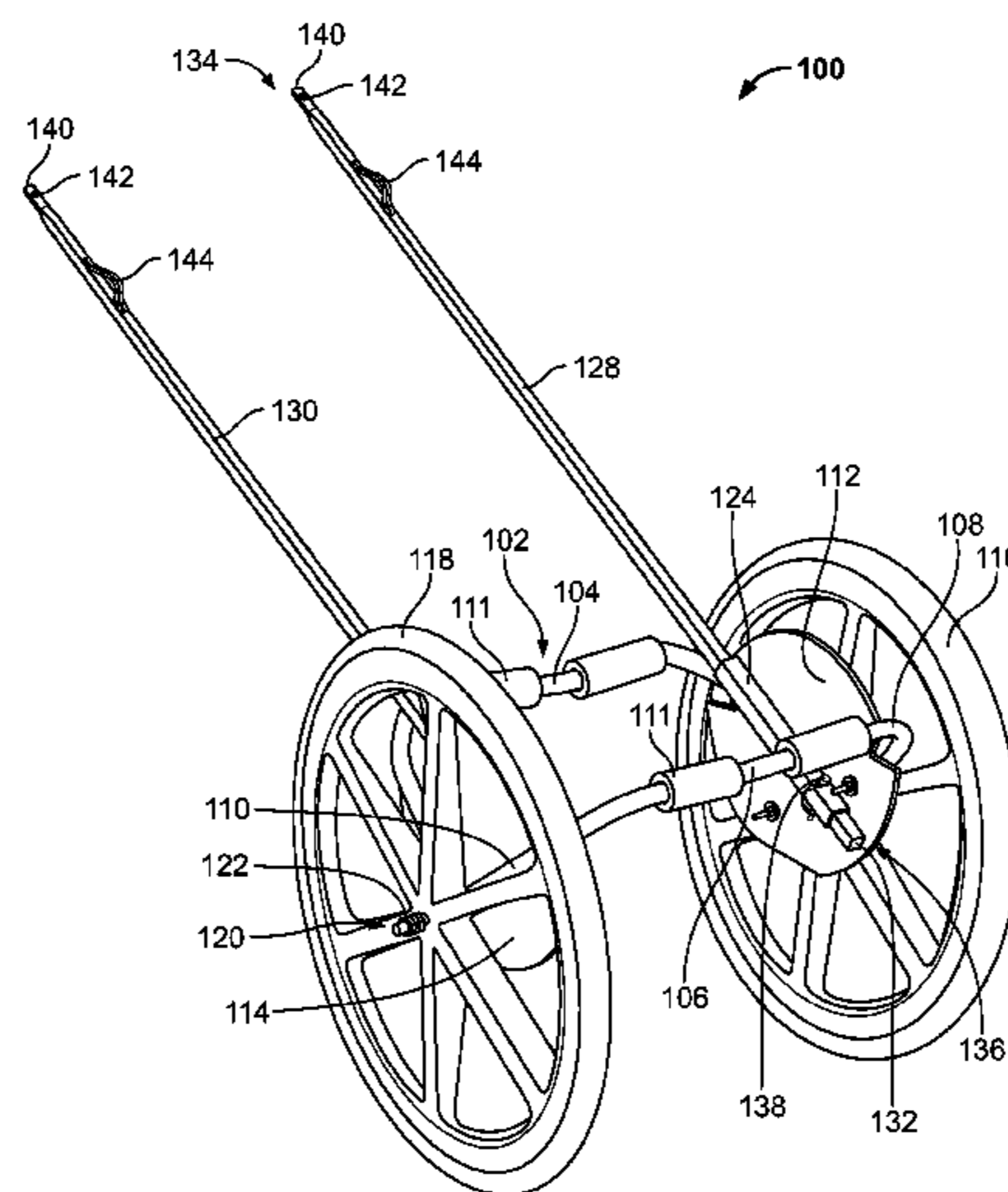
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(57) **ABSTRACT**

Exemplary embodiments of an expedition cart are provided. The expedition cart includes a chassis configured and dimensioned to support a load. The expedition cart includes a first gusset plate and a second gusset plate secured to the chassis. The expedition cart further includes a first sleeve mounted to the first gusset plate and a second sleeve mounted to the second gusset plate. The first sleeve can be configured and dimensioned to releasably receive therein at least a portion of a first shaft arm. The second sleeve can be configured and dimensioned to releasably receive therein at least a portion of a second shaft arm. Exemplary expedition cart systems and methods of assembling an expedition cart are also provided.

**22 Claims, 12 Drawing Sheets**



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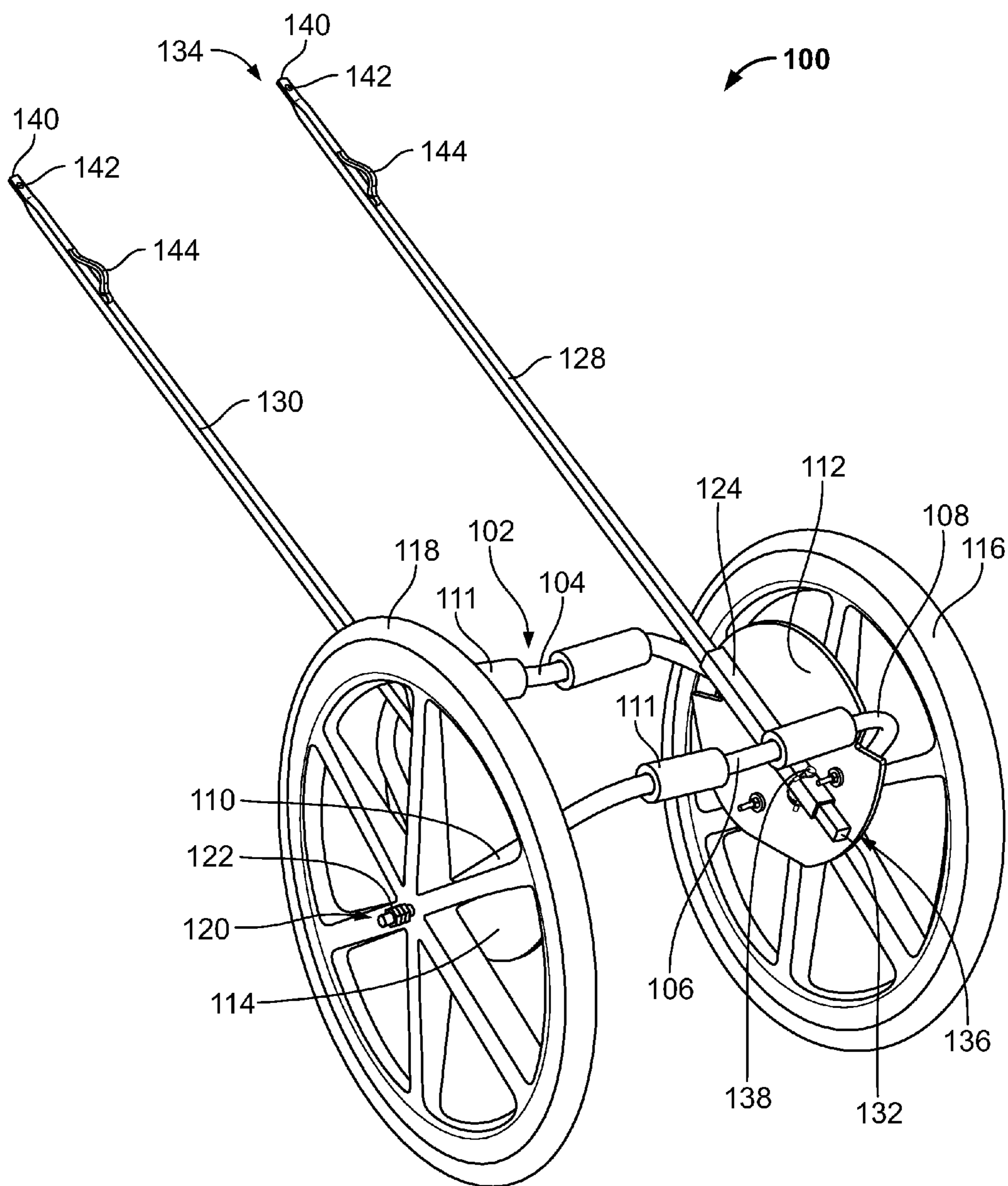


FIG. 1

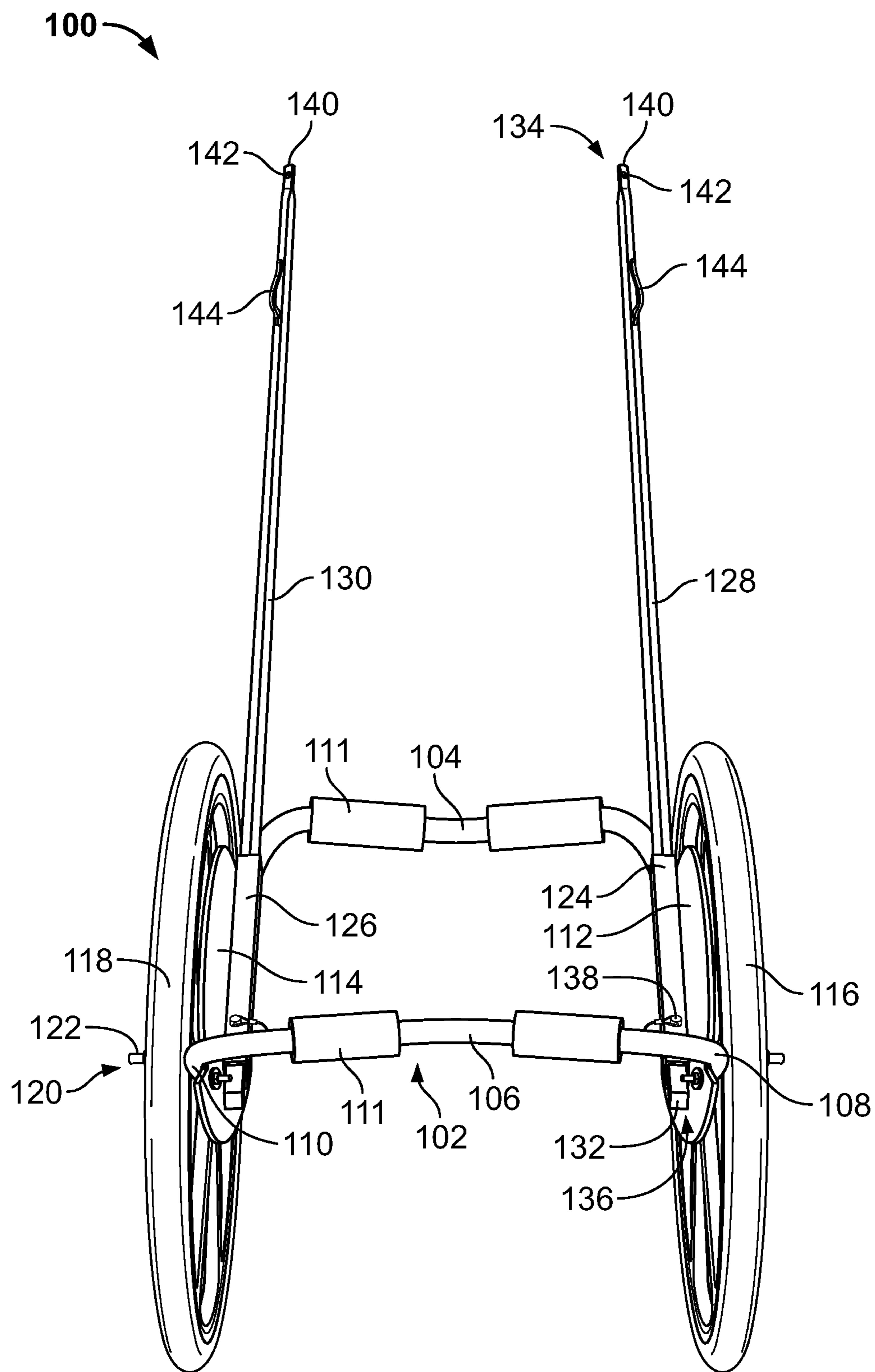


FIG. 2

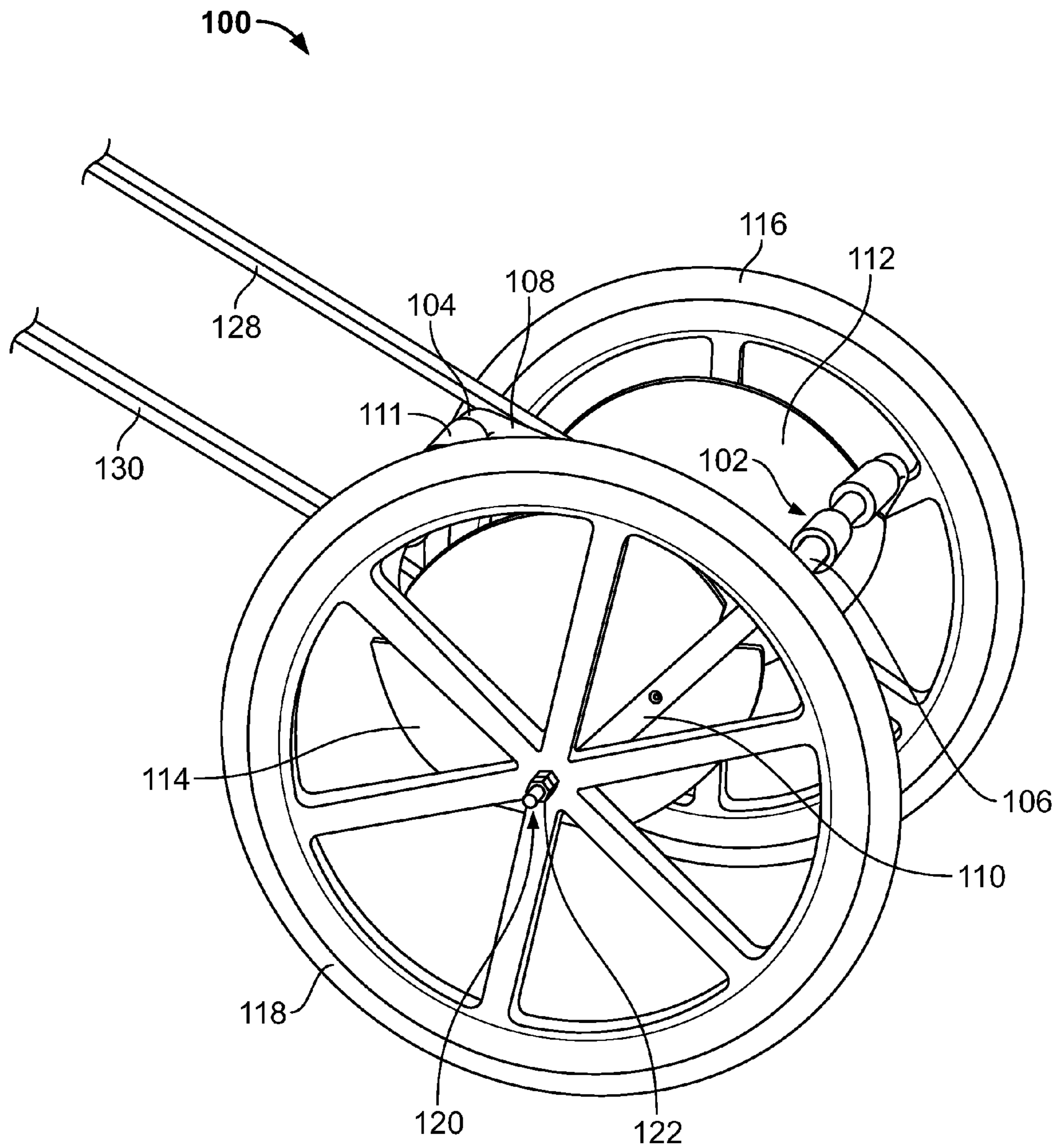


FIG. 3

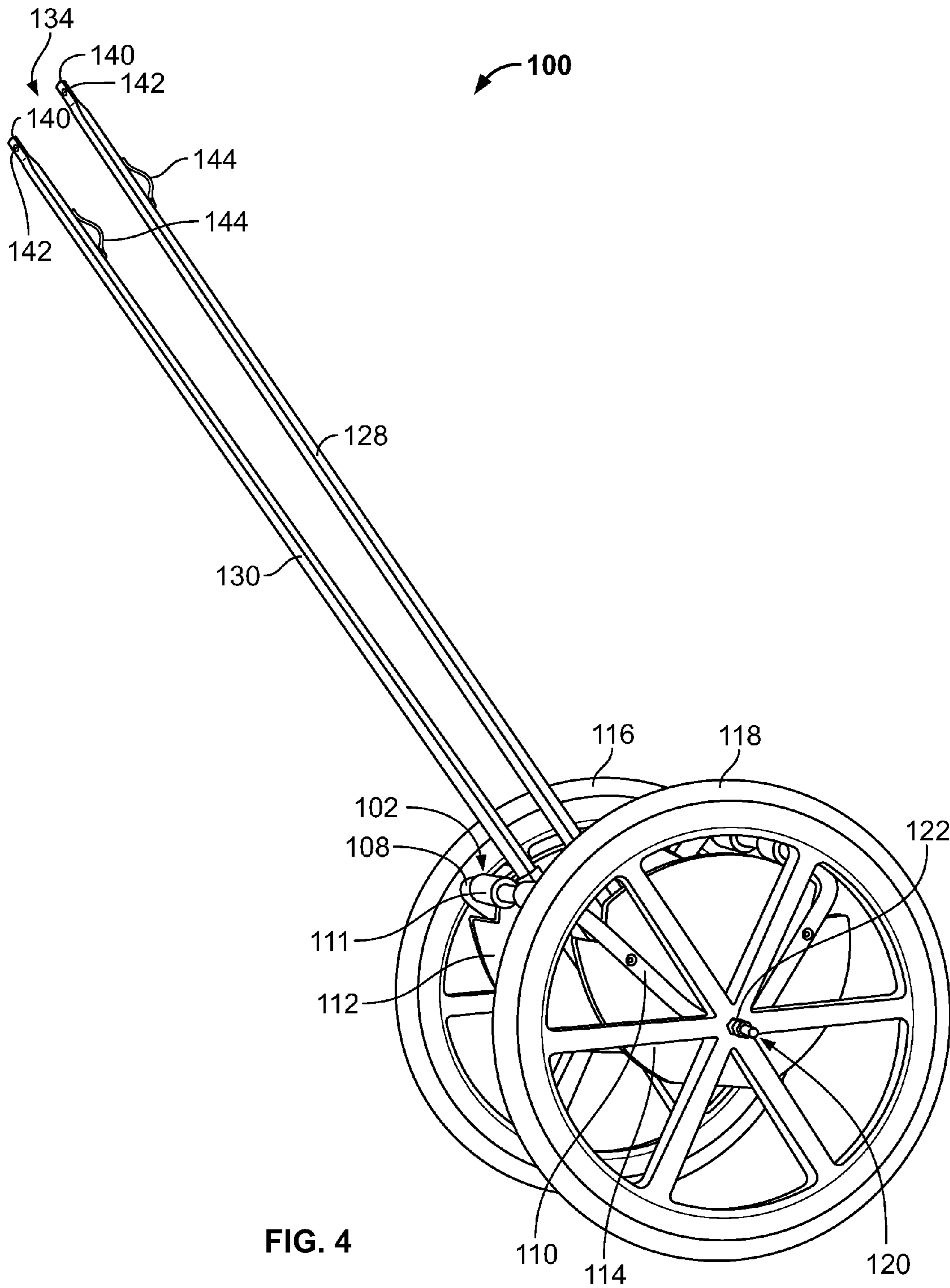


FIG. 4

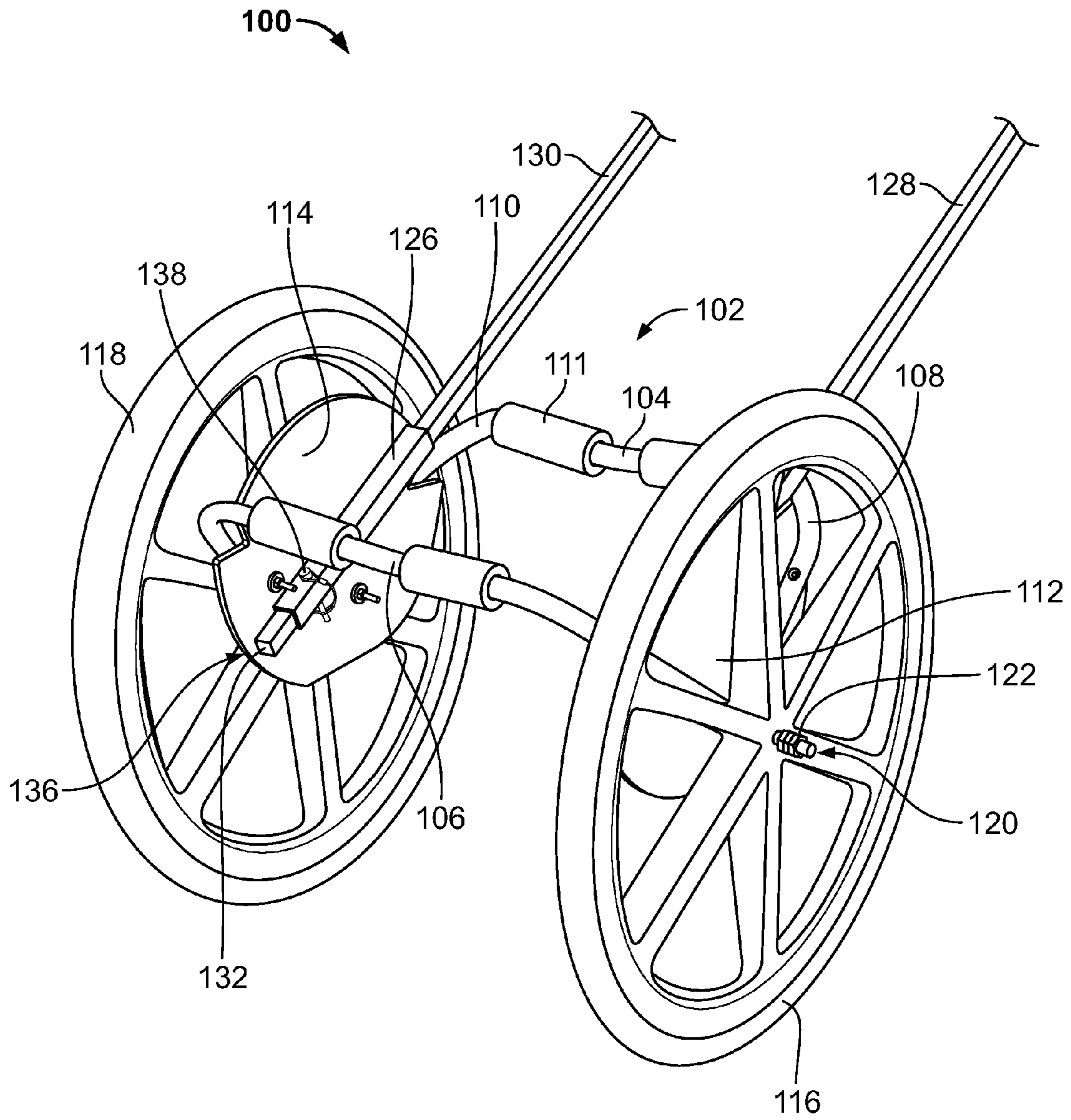


FIG. 5

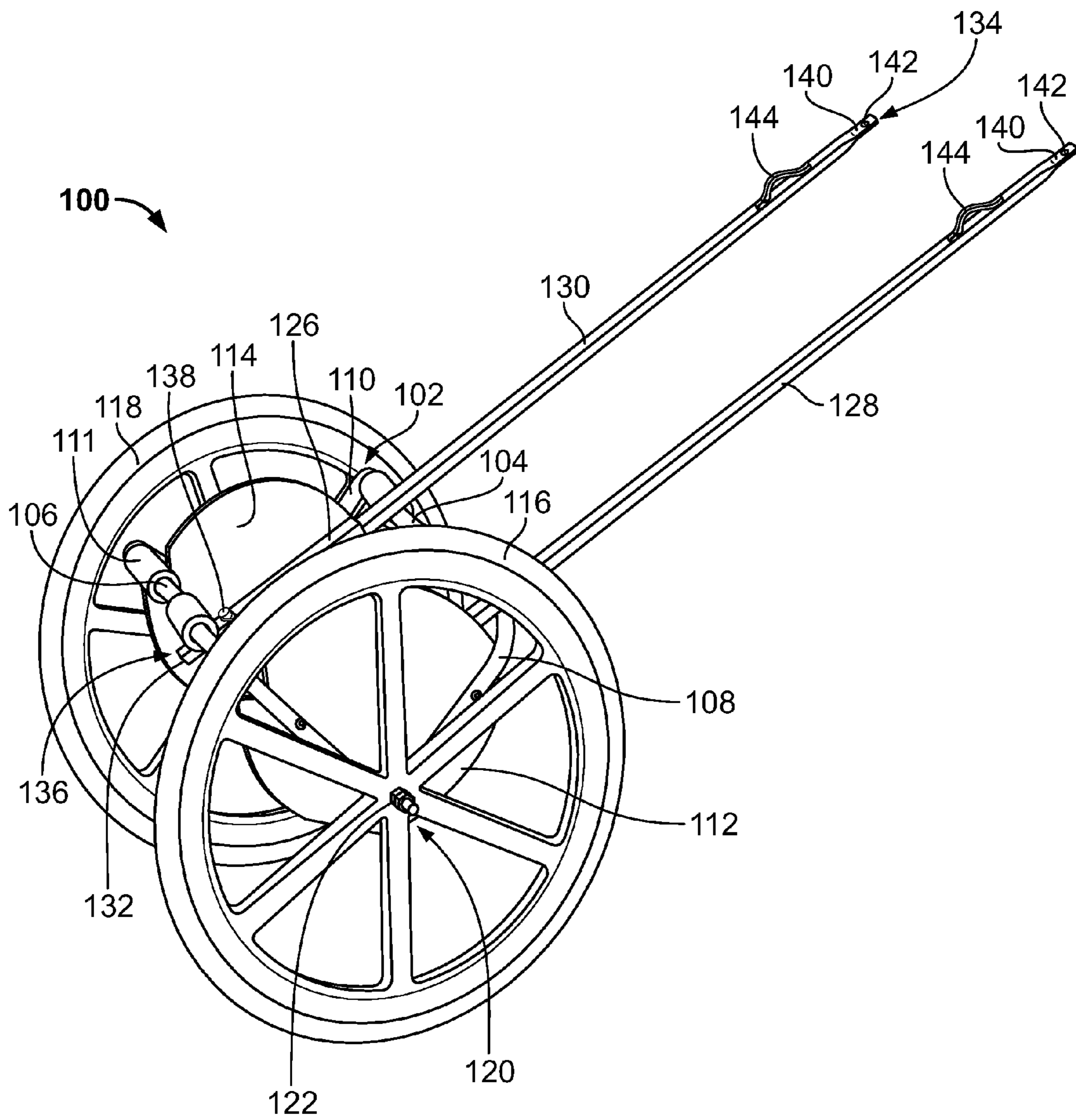


FIG. 6



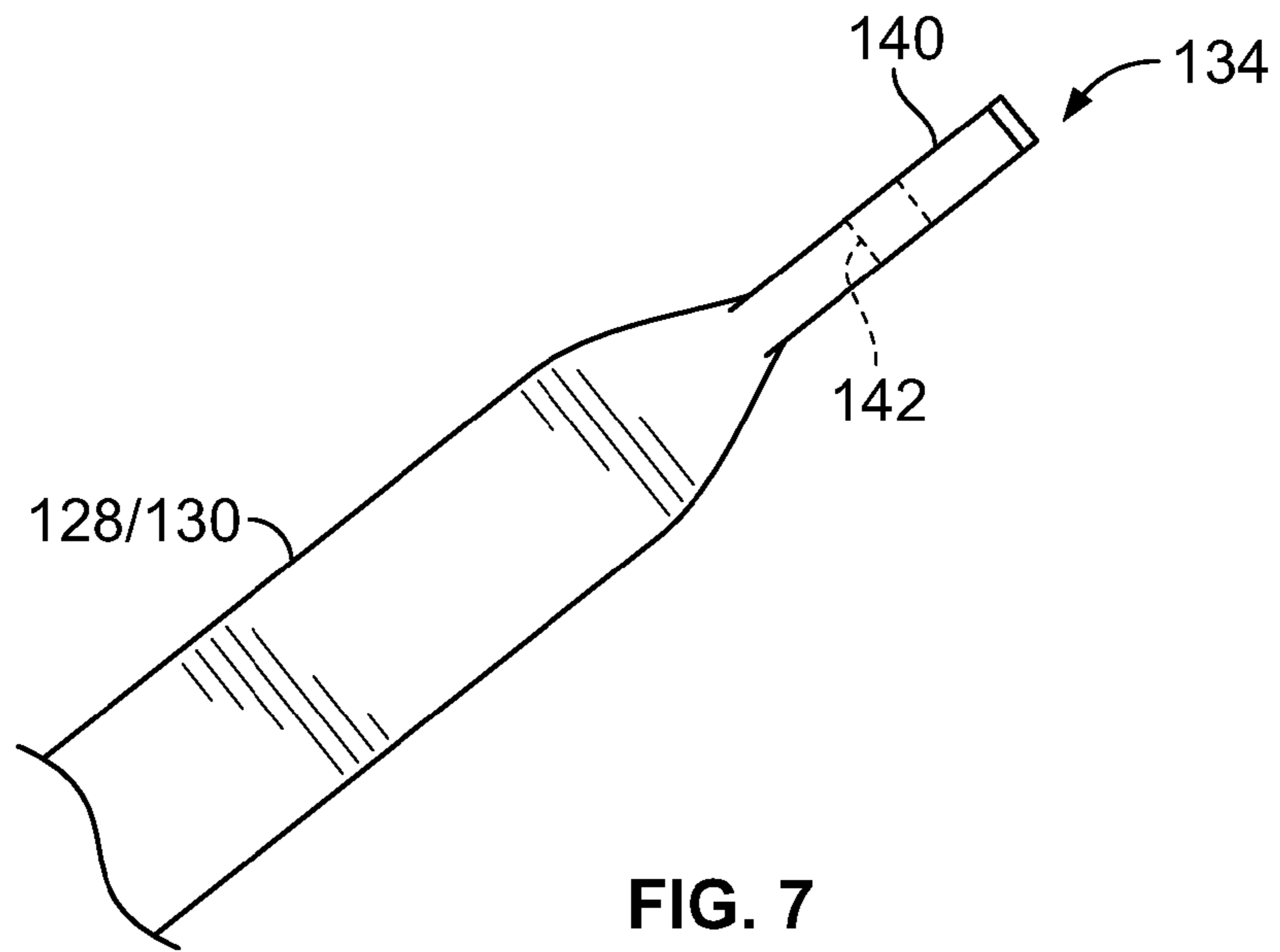


FIG. 7

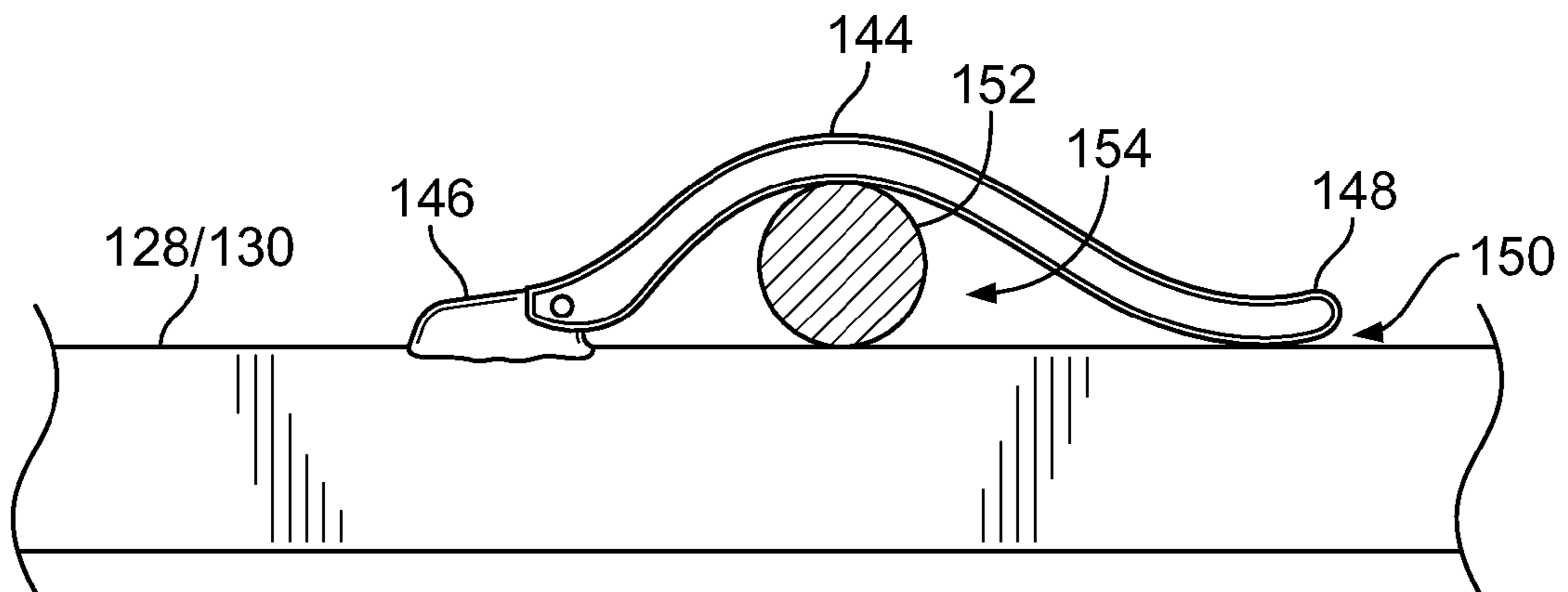


FIG. 8

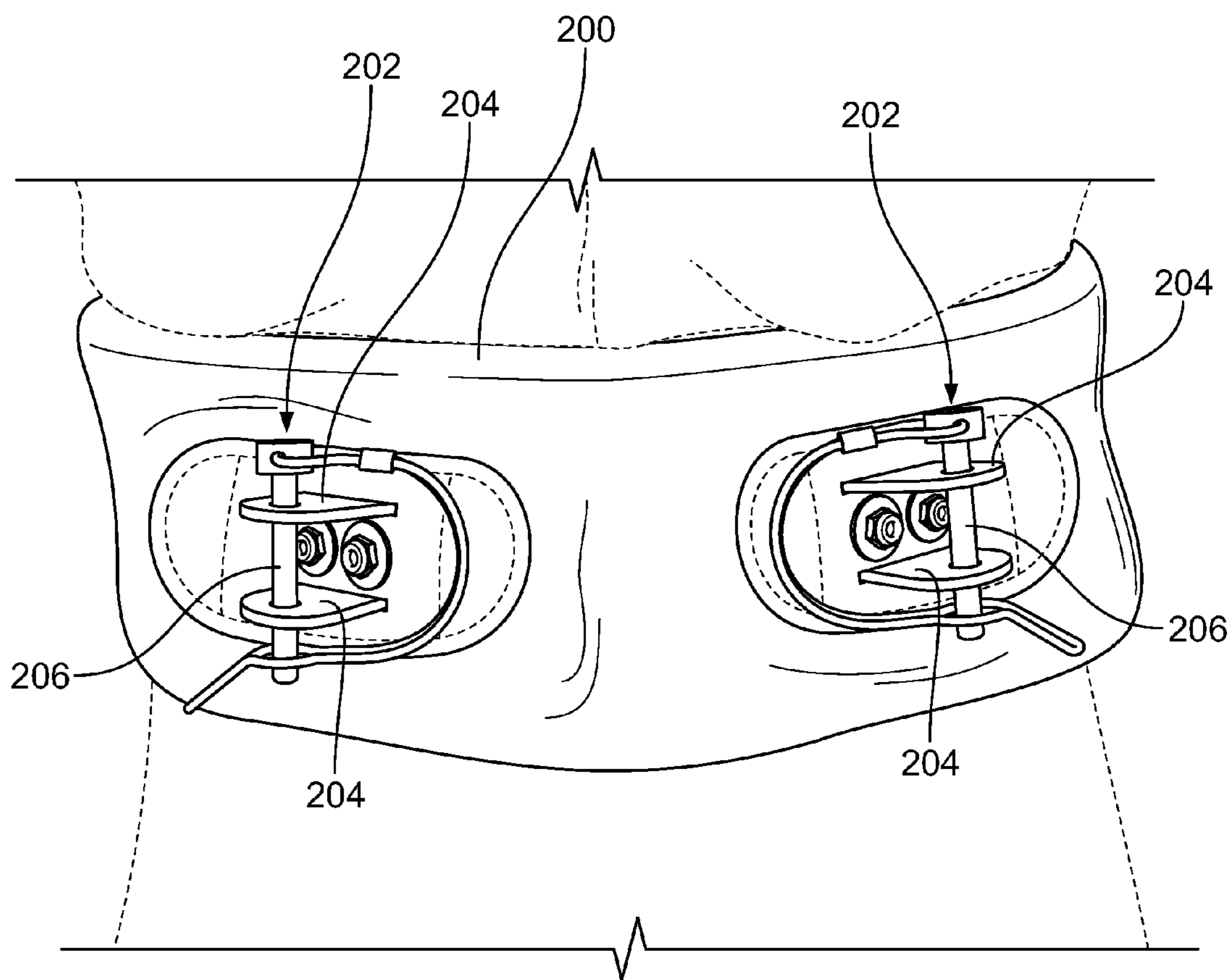


FIG. 9

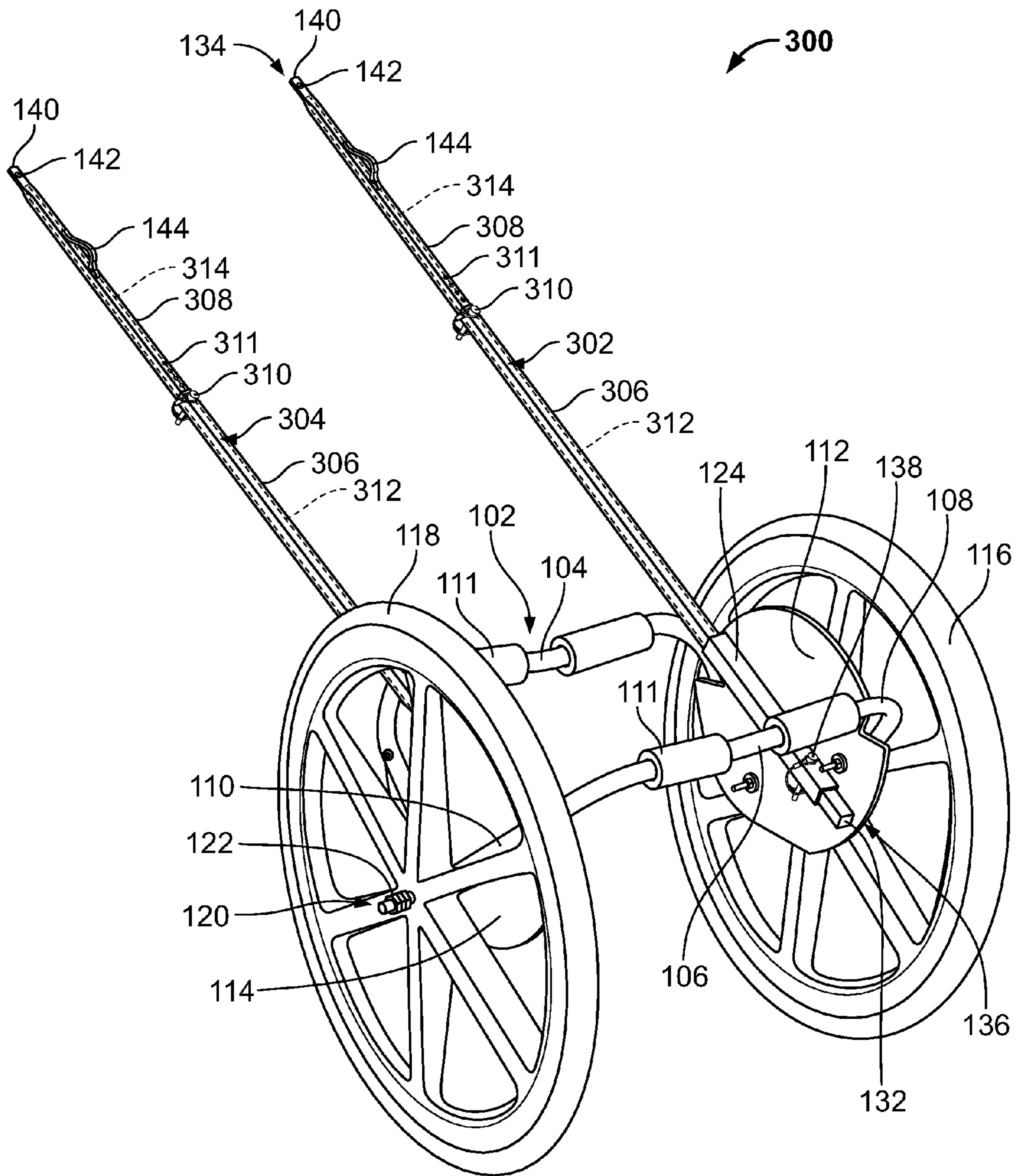


FIG. 10

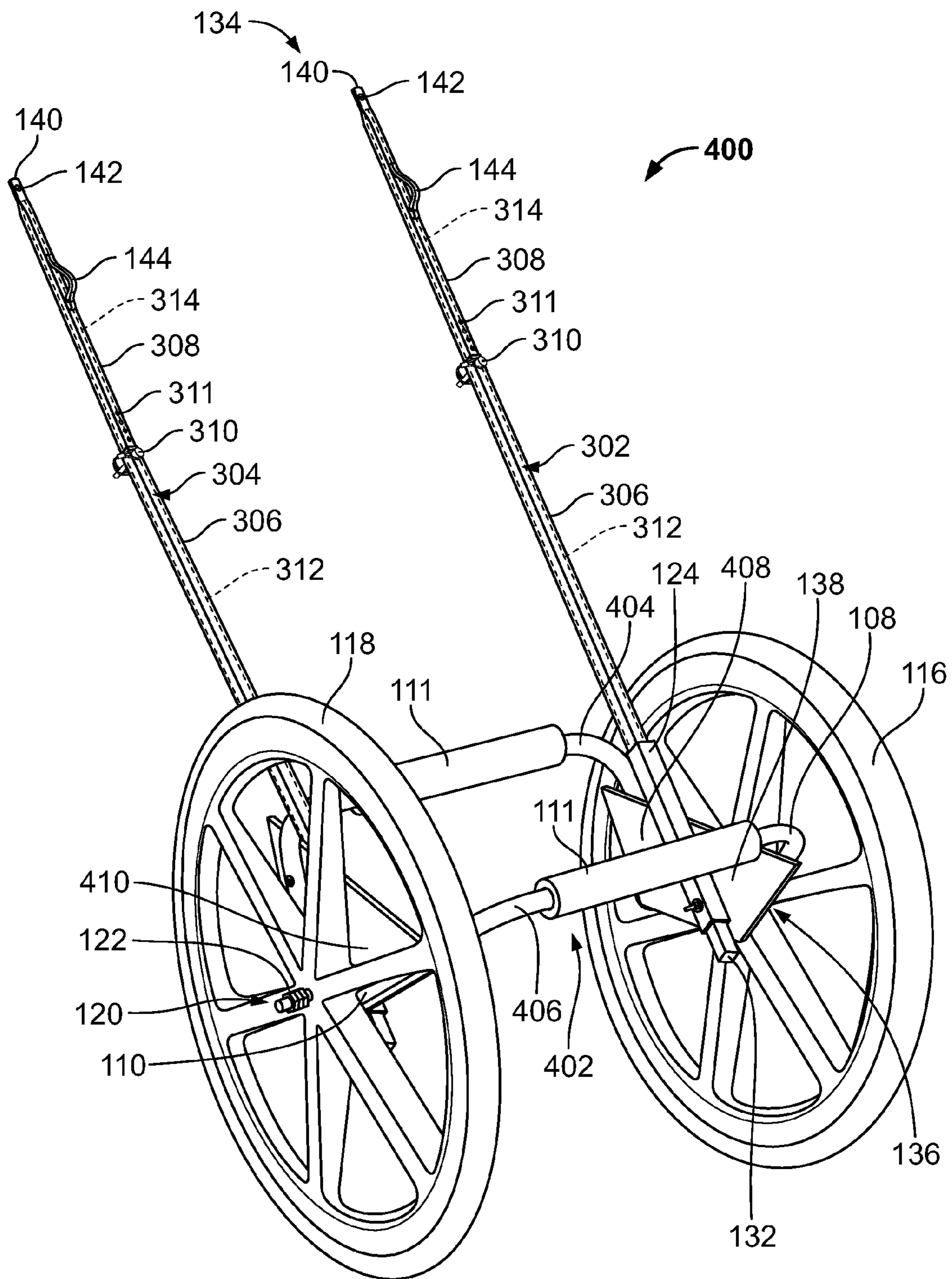


FIG. 11

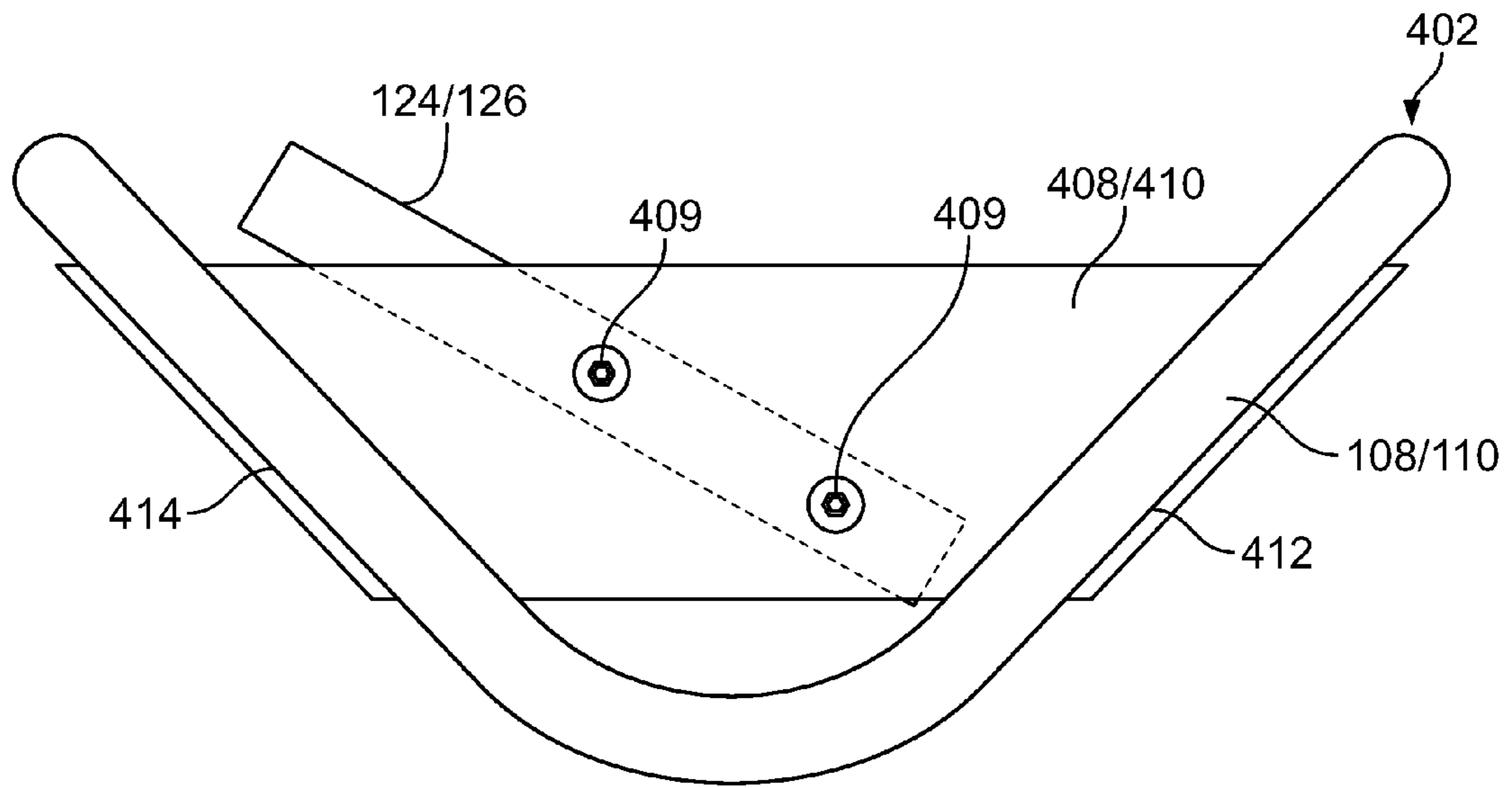


FIG. 12

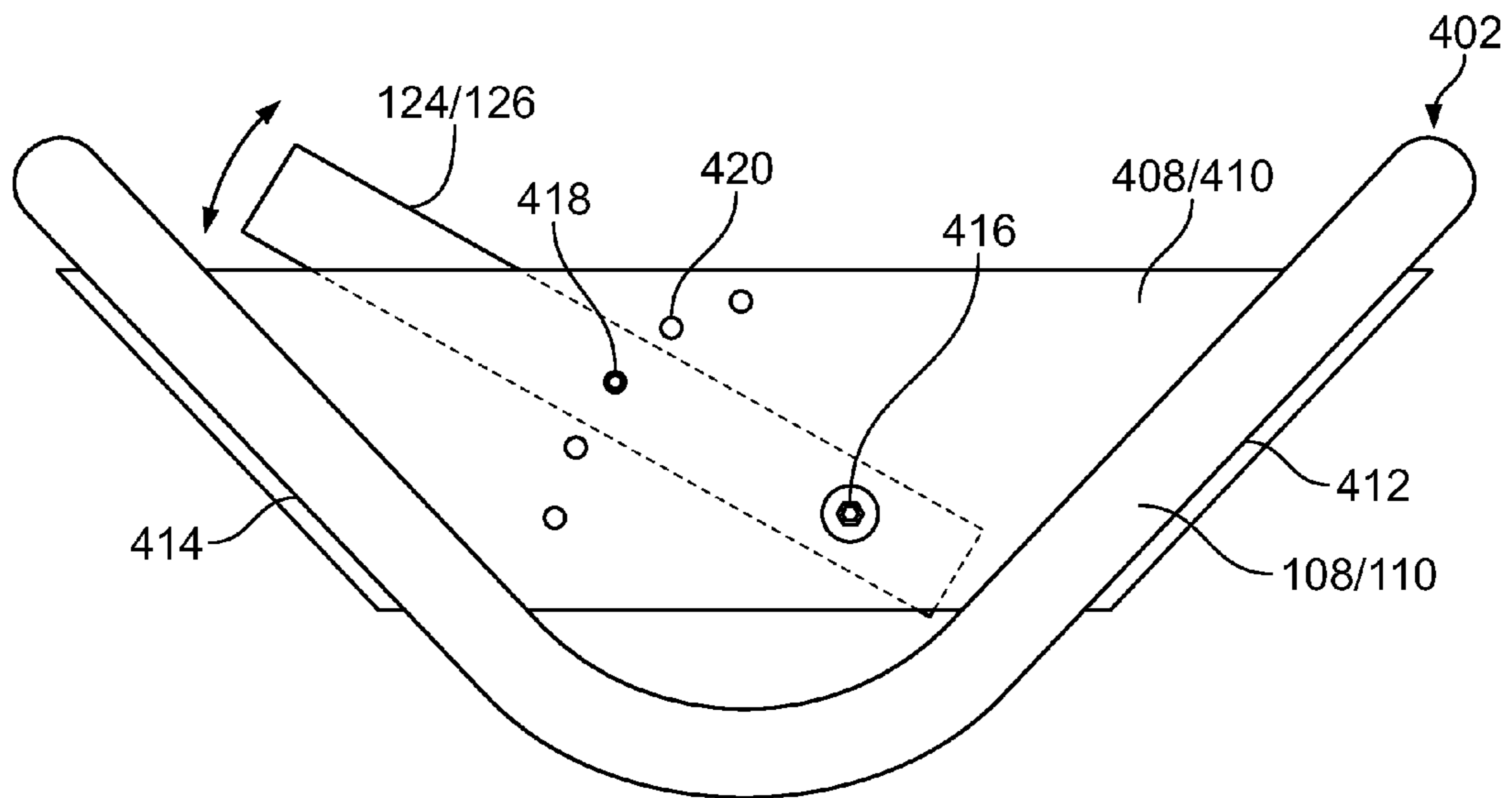


FIG. 13

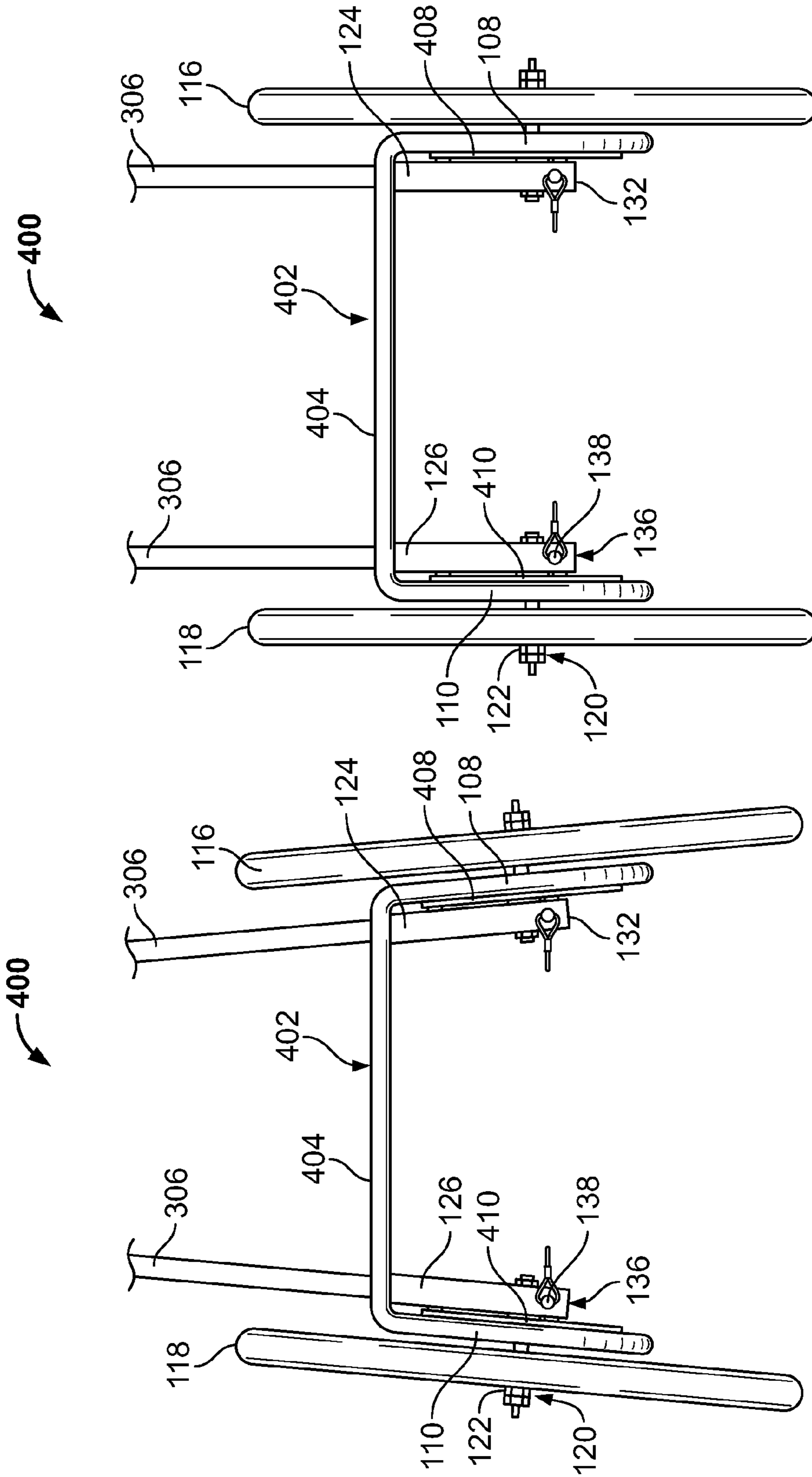


FIG. 15

FIG. 14

## EXPEDITION CARTS AND ASSOCIATED SYSTEMS AND METHODS

### CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Patent Application No. 61/845,986, which was filed on Jul. 13, 2013. The entire content of the foregoing provisional patent application is incorporated herein by reference.

### TECHNICAL FIELD

The present invention generally relates to lightweight expedition carts for use in carrying supplies over outdoor terrains and, in particular, to expedition carts which are capable of being customized based on user characteristics or a user activity, and including components for enhanced load and force distribution, sleeve mounting, and hub reinforcement.

### BACKGROUND

Expeditions are a function of distance, load, time, terrain, and packed gear. Regardless of the destination, be it mountaintop or ocean shore, the most grueling aspect of outdoor expeditions is not the distance, but rather the burden carried. Shouldered loads arrest or abort more expeditions than blistered toes. One method of carrying loads during long distance expedition trips is to pack items in a backpack and wear the backpack on one's body. However, over time, this can cause physical injury to a person's back, hip, legs, or feet.

Thus, a need exists for a means of carrying loads during an expedition over a variety of terrains which reduce the weight supported by the person and reduce the risk of injury to the person. These and other needs are addressed by the expedition carts and associated systems and methods of the present disclosure.

### SUMMARY

In accordance with embodiments of the present disclosure, exemplary expedition carts, e.g., pull carts, are provided that allow a person to carry heavy loads during an expedition over a variety of terrains or landscapes for long distances. The expedition carts can be fabricated of sturdy materials which allow the expedition cart to endure virtually any terrain encountered throughout extended epics of travel. Use of an expedition cart to carry expedition equipment and supplies can alleviate or eliminate the problems associated with an expedition. The expedition cart can be easily and effectively pulled and maneuvered over a variety of terrains, including rough terrains. In addition, due to the lightweight structure of the expedition cart, the user can disassemble, store and carry the expedition cart when the terrain becomes unsuitable for use of the expedition cart or pulling the expedition cart becomes impractical, e.g., during very steep inclines and declines, extremely muddy terrain, river crossings, and the like. The expedition cart can be fabricated from lightweight materials, resulting in a lightweight expedition cart, yet strong enough to endure rough use. The exemplary expedition cart can therefore be easily maneuvered and can be disassembled and carried by a user when desired.

In accordance with embodiments of the present disclosure, exemplary expedition carts are provided that include a chassis configured and dimensioned to support a load. The expedition carts include first and second gusset plates secured to the

chassis. The expedition carts further include a first sleeve mounted to the first gusset plate and a second sleeve mounted to the second gusset plate. The first sleeve can be configured and dimensioned to releasably receive therein at least a portion of a first shaft arm. The second sleeve can be configured and dimensioned to releasably receive therein at least a portion of a second shaft arm.

In some embodiments, the first and second shaft arms can be telescoping. In such embodiments, each of the first and second shaft arms can include a first tubular member and a second tubular member. The second tubular member can be configured to translate within the first tubular member.

The chassis can include a pair of substantially horizontal segments joined by a pair of side segments. The chassis can be fabricated from, e.g., a higher quality aluminum tubing, titanium tubing, carbon, and the like. In some embodiments, one or more sections of the horizontal segments can be wrapped or can include insulating foam or rubber tubing which can cushion the load on the expedition cart, dampen stresses, and add a frictional coefficient to reduce the hazard of load slippage. The pair of side segments can be V-shaped. In some embodiments, the pair of side segments can be outwardly splayed or angled relative to the pair of horizontal segments. First and second wheels mounted to the pair of side segments can be outwardly splayed relative to the pair of horizontal segments, thereby providing greater stability to the expedition cart. It should be understood that outwardly splayed refers to the wheels being positioned closer relative to each other at the top surfaces of the wheels and further apart relative to each other at the bottom or ground-contacting surface of the wheels. The first and second wheels can be mounted to the chassis by two separate and aligned hub bolts. In splayed wheel embodiments, the hub bolts for the wheels can be angled relative to each other.

In some embodiments, the first and second sleeves can be fixedly mounted to the first and second gusset plates, respectively. In some embodiments, the first and second sleeves can be pivotally or adjustably mounted to the first and second gusset plates, respectively. Pivoting the first and second sleeves relative to the first and second gusset plates can vary an angle of inclination of the first and second shaft arms relative to the first and second gusset plates and the chassis. An adjustment of the angle of inclination of the first and second shaft arms allows customization of the expedition cart to ensure that the loading deck defined by the horizontal segments of the chassis can be substantially level during trekking on level ground. Each of the first and second sleeves includes a pivot point and a locking mechanism, e.g., a spring-loaded pin. The first and second gusset plates can include a plurality of radially spaced holes. Each of the plurality of radially spaced holes can be configured and dimensioned to receive the locking mechanism of the first and second sleeves.

In some embodiments, the first and second shaft arms can include a flattened distal portion. The flattened distal portion can include a bore, e.g., a center bore, extending there-through. The flattened distal portion and the bore of each of the first and second shaft arms can be configured to be received by and interlock relative to an interlocking mechanism of a belt or harness worn by a user.

In some embodiments, each of the first and second shaft arms can be at least partially filled with a dampening material, e.g., a core rod of plastic, to absorb and dampen impact stresses. Each of the first and second shaft arms can include a bracket, e.g., a spring-loaded clip, mounted thereon near a distal end. The bracket can be configured and dimensioned to releasably receive an elongated structure, e.g., a walking

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stick, therein. The elongated structure can be used to push and/or pull the expedition cart.

In accordance with embodiments of the present disclosure, exemplary expedition cart systems are provided that include an expedition cart as described herein. The systems further include a belt or harness to be worn by a user. The belt or harness can include a pair of interlocking mechanisms which can be configured and dimensioned to releasably interlock the flattened portion of the first and second shaft arms therein. Thus, rather than gripping and pulling the expedition cart, the expedition cart can be pulled through the belt or harness of the user.

In accordance with embodiments of the present disclosure, exemplary methods of assembling an expedition cart are provided that include providing an expedition cart as described herein. The methods include releasably securing at least a portion of a first shaft arm within the first sleeve and releasably securing at least a portion of a second shaft arm within the second sleeve. In some embodiments, the methods include pivoting the first and second sleeves to vary an angle of inclination of the first and second shaft arms relative to the first and second gusset plates and the chassis. The expedition cart can thereby be customized based on user characteristics (e.g., height), the type of activity for which the expedition cart will be used, user preferences, and the like.

Other objects and features will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are designed as an illustration only and not as a definition of the limits of the invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

To assist those of skill in the art in making and using the disclosed expedition carts and associated systems and methods, reference is made to the accompanying figures, wherein:

FIG. 1 is a perspective, front view of an exemplary expedition cart according to the present disclosure;

FIG. 2 is a front view of the exemplary expedition cart of FIG. 1;

FIG. 3 is a detailed, side view of the exemplary expedition cart of FIG. 1;

FIG. 4 is a side view of the exemplary expedition cart of FIG. 1;

FIG. 5 is a perspective, front view of a chassis of the exemplary expedition cart of FIG. 1;

FIG. 6 is a perspective, side view of the exemplary expedition cart of FIG. 1;

FIG. 7 is a detailed, side view of a handle of the exemplary expedition cart of FIG. 1;

FIG. 8 is a detailed, side view of a handle of the exemplary expedition cart of FIG. 1;

FIG. 9 is a perspective view of an exemplary harness configured to releasably receive a handle of the exemplary expedition cart of FIG. 1;

FIG. 10 is a perspective view of an exemplary expedition cart including telescoping handles according to the present disclosure;

FIG. 11 is a perspective view of an exemplary expedition cart according to the present disclosure;

FIG. 12 is a detailed, side view of an exemplary gusset plate and sleeve according to the present disclosure;

FIG. 13 is a detailed, side view of an exemplary gusset plate and adjustable sleeve according to the present disclosure;

FIG. 14 is a detailed, front view of an exemplary chassis according to the present disclosure; and

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FIG. 15 is a detailed, front view of an exemplary chassis according to the present disclosure.

#### DESCRIPTION OF EXEMPLARY EMBODIMENTS

With reference to FIGS. 1-8, an exemplary expedition cart **100** is provided that includes a chassis **102**, e.g., a frame body, for supporting a load to be carried on the expedition cart **100**. The chassis **102** includes a pair of substantially horizontal segments **104**, **106** joined together by a pair of side segments **108**, **110**. In some embodiments, one or both of the horizontal segments **104**, **106** can include a bend along the length of the horizontal segments **104**, **106**. For example, one or both of the horizontal segments **104**, **106** can include a bend at a substantially central portion to form a groove into which a load to be carried can be positioned. The bend or curve in the horizontal segments **104**, **106** can assist in maintaining a load positioned on the chassis **102** in the desired position. In some embodiments, the horizontal segments **104**, **106** can be substantially linear and the load can be maintained on the chassis **102** by implementing attachment means, e.g., pack straps, rope, bungee cables, combinations thereof, and the like.

The side segments **108**, **110** can be V-shaped or L-shaped, the endpoints of which join the horizontal segments **104**, **106**. The side segments **108**, **110** thereby create a separation between the horizontal segments **104**, **106** which defines the loading deck onto which a load can be positioned. In particular, the horizontal segments **104**, **106** act as spreaders which define the width of the expedition cart **100** and represent the entirety of the gear storage surface of the expedition cart **100**. For example, a backpack can be positioned on the horizontal segments **104**, **106** such that the horizontal segments **104**, **106** support the backpack thereon. In some embodiments, one or both of the horizontal segments **104**, **106** can include one or more support elements **111**, e.g., foam tubing wrapped around the horizontal segments **104**, **106**, a rubber coating, and the like. In some embodiments, the support elements **111** can be in the form of a textured surface. The support elements **111** can provide a cushion for the load positioned on the chassis **102**, can dampen stresses on the chassis **102**, and add a frictional coefficient to reduce the hazard of load slippage.

In some embodiments, the chassis **102** can be fabricated from a high quality aluminum tubing which is bent into the desired shape. In some embodiments, the chassis **102** can be fabricated from a molded carbon fiber, titanium or equivalently strong and lightweight material. For example, titanium can provide the desired rigidity of the chassis **102** and the desired strength to support a heavy load during an expedition.

However, it should be understood that alternative materials can be implemented as long as the materials are capable of withstanding loads and stresses associated with transporting supplied in a variety of terrains. For example, materials can be selected based on the type of activity the expedition cart **100** will be implemented for. As an example, an expedition cart **100** to be used in mountain trekking which will require lifting of the expedition cart **100** to cross rivers can be fabricated from lighter materials than an expedition cart **100** to be used for transporting items to a beach. Although illustrated as substantially tubular in cross-section, in some embodiments, the chassis **102** can define a square cross-section.

The expedition cart **100** includes a pair of gusset plates **112**, **114** attached to the respective side segments **108**, **110**. The gusset plates **112**, **114** can provide a mounting surface for additional components of the expedition cart **100** and can act to unify and reinforce the chassis **102**. In some embodiments, the gusset plates **112**, **114** can be patterned and cut from



squares of, for example, ¼ inch aluminum flat sheets. However, alternative lightweight materials, e.g., titanium, carbon, and the like, can also be implemented. Although illustrated as substantially circular in shape, in some embodiments, the gusset plates **112**, **114** can define, e.g., rectangular, trapezoidal, triangular shapes, and the like.

The gusset plates **112**, **114** can be attached to the side segments **108**, **110** of the chassis **102** by, e.g., welding or through-bolts for each side segment **108**, **110**, combinations thereof, and the like. However, alternative connection techniques can be used as viable alternative to mount the gusset plates **112**, **114** to the chassis **102**. When the expedition cart **100** moves under a load, the gusset plates **112**, **114** can distribute forces through the chassis **102**, thereby reducing localized stress and eccentric moment events. The gusset plates **112**, **114** can provide enhanced load and force distribution, sleeve mounting surfaces, and hub reinforcement. It should be understood that alternative configurations or designs of the gusset plates **112**, **114** can be used, e.g., smaller gusset plates **112**, **114**. In particular, as long as structural integrities are maintained, smaller gusset plates **112**, **114** generally relates to a lighter expedition cart **100**.

Wheels **116**, **118** can be mounted to the chassis **102** at each respective side segment **108**, **110**. The wheels **116**, **118** can be mounted to the side segments **108**, **110** with wheel hubs or hub bolts **120**. In some embodiments, the nadir of the V-shape or L-shape of the side segments **108**, **110** can be flattened such that the side segments **108**, **110** can mate relative to a wheel hub. In some embodiments, the nadir of the side segments **108**, **110** can remain substantially round in cross-section and a pivot hole can be drilled through the side segments **108**, **110** and the gusset plates **112**, **114** to receive a hub bolt **120**, e.g., an axle. The wheels **116**, **118** can be secured to the hub bolt **120** with a locking nut **122**.

Although illustrated as substantially perpendicular to the horizontal segments **104**, **106**, in some embodiments, the side segments **108**, **110** can be gradually angled or splayed relative to the horizontal segments **104**, **106**. For example, the side segments **108**, **110** can be positioned closer relative to each other at the points of contact with the horizontal segments **104**, **106** and can be angled outwardly by, e.g., approximately three degrees, approximately five degrees, approximately seven degrees, and the like, such that the side segments **108**, **110** are positioned further apart relative to each other at the nadir of the side segments **108**, **110**. The angled or splayed side segments **108**, **110** can result in angled or splayed mounting of the wheels **116**, **118** relative to the chassis **102**. The angled or splayed wheels **116**, **118** can provide additional stability for the expedition cart **100** and reduce or prevent instances of the chassis **102** flipping over when the wheels **116**, **118** pass over obstacles.

In some embodiments, the wheels **116**, **118** can include spokes **116**, **118**. In some embodiments, the wheels **116**, **118** can be spokeless and can include solid tires which are positioned outside of the chassis **102**. The hub bolts **120** on which the wheels **116**, **118** are mounted can be of a quick release type. The hub bolts **120** can extend through the gusset plate **112**, **114**, the chassis **102** and the wheel **116**, **118**. By providing wheels **116**, **118** on separate hub bolts **120** (rather than on a single wheel axle), the ground clearance of the expedition cart **100** can be raised substantially above the height of the axis of rotation of the wheels **116**, **118**.

For example, in some embodiments, the wheels **116**, **118** define a diameter of approximately twenty-four inches and an axis of rotation at a height from the ground of approximately twelve inches. However, the load carried on the loading deck defined by the horizontal segments **104**, **106** of the chassis

**102** can be at a height of approximately nineteen inches, providing the expedition cart **100** with additional ground clearance of approximately seven inches as compared to a cart having a single central wheel axle. The expedition cart **100** can thereby avoid becoming caught on a greater number of ground obstacles, such as small bushes, rocks, branches, and the like. It should be understood that the dimensions of the expedition cart **100** discussed herein, including the width of the horizontal segments **104**, **106** and the size of the wheels **116**, **118**, can be varied while still falling within the intended scope of the invention. For example, in some embodiments, when the expedition cart **100** is disassembled and strapped to a backpack worn by a user, the twenty-four inch wheels **116**, **118** can provide sufficient clearance of the backpack, while being positioned adjacent to the back of the user. Although the wheels **116**, **118** can be dimensioned to be greater than twenty-four inches, a greater height of the wheels **116**, **118** can increase the height of the chassis **102**, thereby resulting in risk of less stability of the chassis **102**. In such embodiments, stability of the chassis **102** can be increased by, e.g., increasing the splay of the wheels **116**, **118** relative to the chassis **102**, increasing the width between the wheels **116**, **118**, combinations thereof, and the like.

The expedition cart **100** further includes a pair of shaft-arm or handle sleeves **124**, **126**. The sleeves **124**, **126** can be fabricated from, e.g., aluminum, carbon, titanium, and the like. The sleeves **124**, **126** can be mounted to the gusset plates **112**, **114** by welding. For example, the sleeves **124**, **126** can be welded to the gusset plates **112**, **114** at an angle designed to maintain a level loading deck defined by the horizontal segments **104**, **106** while traveling on level ground.

In some embodiments, the sleeves **124**, **126** can be pivotally positioned relative to the gusset plates **112**, **114** such that the angle of inclination of the sleeves **124**, **126** relative to the loading deck of the chassis **102** can be adjusted or customized based on user characteristics, e.g., height, the type of activity the expedition cart **100** is to be used for, and user preferences. For example, the sleeves **124**, **126** can be flexibly connected to the gusset plates **112**, **114** by center pinning and can include a spring-loaded pin configured to be received in graduated holes formed in the gusset plates **112**, **114**. In some embodiments, the gusset plates **112**, **114** can include a viewable protractor adjacent to the graduated holes to indicate to a user the different angles of inclination relative to the loading deck. The sleeves **124**, **126** can thereby be adjusted at the point-of-sale based on user characteristics, user activities, or both, or can be adjusted in the field based on, for example, varying slopes of travel.

The sleeves **124**, **126** can be mounted substantially parallel relative to each other. The cross-sectional configuration of the sleeves **124**, **126** can be, e.g., square, circular, and the like, and can be configured and dimensioned to receive a respective shaft arm **128**, **130**, e.g., handle, therein. In some embodiments, the sleeves **124**, **126** can define two open ends. In some embodiments, the sleeves **124**, **126** can define only one open end configured to receive a portion of the shaft arm **128**, **130** and the closed opposing end can assist in retaining the shaft arm **128**, **130** secured within the sleeve **124**, **126**.

As discussed above, the expedition cart **100** includes a pair of shaft arms **128**, **130** which define a proximal end **132** and a distal end **134**. The shaft arms **128**, **130** can be detachably secured to and can extend from the respective sleeves **124**, **126**. In particular, the proximal end **132** of the shaft arms **128**, **130** can be secured to the chassis **102** at the sleeves **124**, **126**, and the distal end **134** of the shaft arms **128**, **130** can be gripped by a user, secured to a belt or harness of a user, or both. The shaft arms **128**, **130** length can be calculated to

satisfy load overhang, leg stride, waist height, combinations thereof, and the like. Although illustrated as fixed in length, in some embodiments, the shaft arms **128**, **130** can be, e.g., customized by user characteristics, customized by user activity, telescoping to allow field adjustments or customization based on varying topographic contours and user characteristics (see, for example, FIG. **10**).

The shaft arms **128**, **130** can be galvanically compatible, rustproofed, gasketed, primed and/or painted and can be axially reliable. In some embodiments, the shaft arms **128**, **130** can be circular in cross-section. In some embodiments, the shaft arms **128**, **130** can define a square cross-section. The shaft arms **128**, **130** can be fabricated from, e.g., aluminum, titanium, carbon, steel, and the like. In some embodiments, the shaft arms **128**, **130** can be filled with a dampening material, e.g., a core rod of acrylonitrile butadiene styrene (ABS) plastic, to absorb and dampen impact stresses. In some embodiments, the shaft arms **128**, **130** can include caps **136** on the bottom portion of the proximal end **132** to prevent intrusion of dirt and debris.

In some embodiments, after being inserted into the sleeves **124**, **126**, the proximal end **132** of the shaft arms **128**, **130** can be releasably secured in the sleeves **124**, **126** by respective clevis pins **138**. For example, the sleeves **124**, **126** can include guide holes passing through the width of the sleeves **124**, **126** and the shaft arms **128**, **130** near the proximal end **132** can include a complementary guide hole passing through the width of the shaft arms **128**, **130**.

The guide holes can be configured and dimensioned to receive a quick release wire lock clevis pin **138**. Thus, when the proximal ends **132** of the shaft arms **128**, **130** are inserted into the respective sleeves **124**, **126**, clevis pins **138** can be used to releasably lock the shaft arms **128**, **130** within the sleeves **124**, **126**. In some embodiments, two clevis pins **138** can be used for each shaft arm **128**, **130** to ensure a rigid connection between the sleeves **124**, **126** and shaft arms **128**, **130**.

In some embodiments, the distal end **134** of the shaft arms **128**, **130** can include a gripping structure thereon, e.g., a textured surface, a foam cover, a rubber cover, and the like, to provide an area at which the user can grip the shaft arms **128**, **130** for pulling the expedition cart **100**. With reference to FIG. **7**, in some embodiments, a portion of the distal end **134** of the shaft arms **128**, **130** can be flattened into a horizontal or vertical paddle **140**. For example, a portion of the shaft arms **128**, **130** can be peened flat into the flattened paddle **140** configuration. Each of the paddles **140** can include a center boring **142** passing therethrough. The paddle **140** and the boring **142** can be configured and dimensioned to releasably interlock relative to a waist belt or torso/shoulder harness worn by a user (see, for example, FIG. **9**). As will be discussed in greater detail below, the flattened paddle **140** can be positioned between two separated flanges including complementary center bores and, for example, respective quick release wire lock clevis pins can be used to secure the shaft arms **128**, **130** relative to the belt or harness of a user. Thus, rather than gripping and pulling the expedition cart **100**, the expedition cart **100** can be secured to the belt or harness of a user and the user can maintain free hands for alternative purposes.

The exemplary expedition cart **100** discussed herein can also be implemented for pushing a load. In particular, with reference to FIG. **8**, each of the arm shafts **128**, **130** can include a cross bar bracket **144** secured thereon. The brackets **144** can be secured to a top surface of the arm shafts **128**, **130**, e.g., a surface facing away from the ground. In some embodiments, the brackets **144** can be secured to a bottom surface of the arm shafts **128**, **130**, e.g., a surface facing the ground. The

brackets **144** can be in the form of a spring clip. A first end **146** of the brackets **144** facing away from the distal end **134** of the arm shafts **128**, **130** can be fixedly secured (e.g., welded) to the arm shafts **128**, **130** and an opposing second end **148** facing the user can be configured to lift up to create an opening **150**. In some embodiments, the first end **146** can include a hinge at which the bracket **144** can pivot. In some embodiments, the first end **146** can be substantially continuous and the spring force within the bracket **144** can allow flexing of the bracket **144**. As an example, the second end **148** of each bracket **144** can be lifted to create an opening **150** for passage of an elongated structure **152**, e.g., a walking stick, a cross bar, and the like. Upon insertion of the elongated structure **152** under the bracket **144**, the bracket **144** can spring back to an unopened position and can retain the elongated structure **152** within a substantially complementary region **154** formed between the shaft arms **128**, **130** and the bracket **144**. A push bar can thereby be formed for pushing the expedition cart **100**.

In some embodiments, the elongated structure **152** can also be used to pull the expedition cart **100**. In particular, the spring force within the brackets **144** can be sufficiently high to maintain the elongated structure **152** within the region **154** during pulling of the expedition cart **100**. In some embodiments, a locking mechanism can be implemented for releasably locking the elongated structure **152** within the region **154**.

As discussed above, and with reference to FIG. **9**, an exemplary harness **200**, e.g., a belt, is provided for releasably interlocking with the expedition cart **100**. Although illustrated as worn around the waist of a person, it should be understood that alternative configurations of harnesses can be used with the interlocking mechanisms discussed herein. In particular, the harness **200** includes two interlocking mechanisms **202** horizontally spaced relative to each other. Each of the interlocking mechanisms **202** includes a pair of spaced flanges **204** with a hole passing therethrough. The interlocking mechanisms **202** further include a clevis pin **206**, e.g., a wire lock clevis pin **206**, configured and dimensioned to pass through the holes of the flanges **204** and releasably interlock relative to the flanges **204**. A user can thereby insert the respective flattened paddle **140** portions of the shaft arms **128**, **130** in the space formed between the flanges **204** and the clevis pins **206** can be passed through the holes in the flanges **204** and the boring **142** of the flattened paddles **140** to interlock the shaft arms **128**, **130** relative to the harness **200**. Thus, rather than pulling the expedition cart **100** by gripping the shaft arms **128**, **130**, the user can pull the expedition cart **100** with the harness **200** while maintaining their hands free for alternative purposes.

With reference to FIG. **10**, an alternative expedition cart **300** is provided. In particular, the expedition cart **300** can be substantially similar in structure and function to the expedition cart **100** discussed above, except for the distinctions noted herein. Therefore, similar structures are marked with similar reference numbers.

The expedition cart **300** includes telescoping shaft arms **302**, **304**. In particular, each shaft arm **302**, **304** includes a first shaft arm **306** and a second shaft arm **308**, e.g., first and second tubular members, which translate relative to each other. For example, the second shaft arm **308** can translate within the first shaft arm **306** to allow the length of the shaft arms **302**, **304** to be adjusted or customized based on, e.g., user characteristics, user activities, user preferences, and the like.

One or more clevis pins **310**, e.g., wire lock clevis pins, can be implemented for detachably interlocking the first and sec-

ond shaft arms **306, 308** relative to each other. For example, the first shaft arm **306** can include a hole passing therethrough configured and dimensioned to receive the clevis pin **310** therethrough. Similarly, the second shaft arm **308** can include a plurality of spaced holes **311** along the length of the second shaft arm **308** for alignment with the hole of the first shaft arm **306** and receipt of the clevis pin **310**. Thus, the first shaft arms **306** can be inserted into and interlocked relative to the sleeves **124, 126**, and the length of the shaft arms **302, 304** can be adjusted for user preferences by translating the second shaft arm **308** within the first shaft arm **306**. In some embodiments, the first shaft arm **306**, the second shaft arm **308**, or both, can be filled with a dampening material **312, 314**, e.g., a core rod of ABS plastic or a similar material, to absorb and dampen impact stresses.

With reference to FIG. 11, an alternative expedition cart **400** is provided. In particular, the expedition cart **400** can be substantially similar in structure and function to the expedition carts **100, 300** discussed above, except for the distinctions noted herein. Therefore, similar structures are marked with similar reference numbers.

The expedition cart **400** includes a chassis **402** including substantially linear horizontal segments **404, 406**. Thus, rather than defining a bend or curve in the horizontal segments **104, 106**, the horizontal segments **404, 406** extend linearly between the side segments **108, 110**. In addition, the gusset plates **408, 410** of the expedition cart **400** can be substantially trapezoidal in configuration. The trapezoidal configuration allows contact points on both sides of the gusset plates **408, 410** against the side segments **108, 110** and provides sufficient surface area for mounting the sleeves **124, 126**. However, the trapezoidal configuration reduces the amount of material for fabrication, thereby reducing the weight of the expedition cart **400**.

With reference to FIG. 12, in some embodiments, the sleeves **124, 126** can be fixedly bolted to the gusset plates **408, 410** based on an angle of the sleeves **124, 126** relative to the loading deck determined during fabrication. For example, the sleeves **124, 126** can be bolted to the gusset plates **408, 410** with two bolts **409**. The shaft arms **302, 304** therefore extend from the chassis **402** at a fixed angle. If an adjustment of the orientation of the chassis **402** is desired, the telescoping shaft arms **302, 304** can be implemented to regulate the length of the shaft arms **302, 304** which, in turn, affect the orientation of the chassis **402**.

With reference to FIG. 13, in some embodiments, the sleeves **124, 126** can be pivotally secured to the gusset plates **408, 410**. In particular, the sleeves **124, 126** can be mounted such that an angle of the sleeves **124, 126** relative to the loading deck can be adjusted or customized by the user to vary the angle at which the shaft arms **302, 304** extend from the chassis **402**. For example, the sleeves **124, 126** can include respective pivot points **416**, e.g., an axle, rotatably connecting the sleeves **124, 126** to the gusset plates **408, 410**. The sleeves **124, 126** can rotate about the pivot points **416** to adjust the angle of inclination of the sleeves **124, 126**. Adjustment of the angle of inclination of the sleeves **124, 126** can ensure that the loading deck of the chassis **402** is positioned substantially level to the ground during transport on level ground. In particular, based on the angle adjustment, the chassis **402** can be positioned substantially parallel to the ground at all slopes.

Each of the sleeves **124, 126** can include a spring-loaded pin **418**, e.g., a locking mechanism, protruding therefrom at a position spaced from the pivot point **416**. The spring-loaded pin **418** can be configured and dimensioned to snap into a complementary hole **420** formed in the gusset plates **408, 410**. In particular, the gusset plates **408, 410** can include a

plurality of holes **420** radially spaced to allow the sleeves **124, 126** to be interlocked at a variety of angles of inclination. In some embodiments, the angle of inclination of the sleeves **124, 126** can be varied within a range of, e.g., approximately fifteen degrees, eighteen degrees, twenty degrees, and the like. To release and rotate the sleeves **124, 126**, the spring-loaded pin **418** can be depressed by a user. In some embodiments, the gusset plates **408, 410** can include markings or angles adjacent to the respective holes **420** to indicate to a user the angle of the sleeve **124, 126** relative to the loading deck of the chassis **402**. Although illustrated as spring-loaded pins **418**, it should be understood that alternative interlocking mechanisms, e.g., a ratcheting mechanism, can be used to releasably secure the sleeves **124, 126** relative to the gusset plates **408, 410**.

With reference to FIG. 14, in some embodiments, the side segments **108, 110** of the chassis **402** can be angled or splayed relative to the horizontal segments **104, 106**. In particular, the side segments **108, 110** can be angled outward at approximately five degrees such that the side segments **108, 110** are positioned further apart relative to each other at the nadir than at the connecting portions at the horizontal segments **104, 106**. The wheels **116, 118** can thereby be mounted to the side segments **108, 110** in an angled or splayed manner to provide greater stability to the expedition cart **400**.

With reference to FIG. 15, in some embodiments, the side segments **108, 110** of the chassis **402** can be substantially perpendicular relative to the horizontal segments **104, 106**. In particular, the side segments **108, 110** can be substantially parallel relative to each other. The wheels **116, 118** can thereby be mounted to the side segments **108, 110** and relative to each other in a parallel manner.

The expedition carts discussed herein can substantially reduce the amount of load supported by a user. In particular, the expedition carts reduce the amount of pull force to the horizontal component of the weight of the load, plus the friction component due to the wheels. As an example, the expedition cart can be expected to pull an approximately 100 lb load over most surfaces with less than approximately 20 lbs of pull force. The substantial reduction in support allows the user to travel through a variety of terrains while simultaneously transporting a large amount of supplies.

The expedition carts discussed herein can be fabricated from lightweight, yet rigid, materials, thereby resulting in expedition carts which are extremely light and transportable. If a user encounters severely sloped ascents and descents, is required to carry the expedition cart across a river or over muddy conditions, or desires to transport the expedition cart when it is not in use, the expedition cart can be efficiently disassembled for transport within a short time period. For example, the shaft arms can be separated from the respective sleeves by removing the clevis pins and the shaft arms can be pulled out of the sleeves. If telescoping shaft arms are implemented, the shaft arms can be collapsed into a configuration of minimum length. The remaining assembly of the expedition cart can be carried by hand or mounted/strapped to a pack for transport. As discussed above, the wheels can be dimensioned such that when the expedition cart is strapped to a pack, there is sufficient clearance for the pack and the wheels are positioned adjacent to the back of a user. In particular, the implementation of separate hub bolts (rather than a single axle) allows the wheels to fit around the sides of the pack in a more compact and comfortable carrying position.

While exemplary embodiments have been described herein, it is expressly noted that these embodiments should not be construed as limiting, but rather that additions and modifications to what is expressly described herein also are

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included within the scope of the invention. Moreover, it is to be understood that the features of the various embodiments described herein are not mutually exclusive and can exist in various combinations and permutations, even if such combinations or permutations are not made express herein, without departing from the spirit and scope of the invention.

The invention claimed is:

**1.** An expedition cart, comprising:

a chassis configured and dimensioned to support a load, a first gusset plate and a second gusset plate secured to the chassis, each of the first and second gusset plates including side mounting surfaces, and

a first sleeve attached to the side mounting surface of the first gusset plate and a second sleeve attached to the side mounting surface of the second gusset plate,

wherein the first sleeve is configured and dimensioned to releasably receive therein at least a portion of a first shaft arm, and

wherein the second sleeve is configured and dimensioned to releasably receive therein at least a portion of a second shaft arm.

**2.** The expedition cart according to claim **1**, wherein the first and second shaft arms are telescoping.

**3.** The expedition cart according to claim **2**, wherein each of the first and second shaft arms comprises a first tubular member and a second tubular member, the second tubular member configured to translate within the first tubular member.

**4.** The expedition cart according to claim **1**, wherein the chassis comprises a pair of horizontal segments joined by a pair of side segments.

**5.** The expedition cart according to claim **4**, wherein the pair of side segments are V-shaped, the first gusset plate extends across a first side segment of the pair of side segments between two opposing contact points of the first side segment, and the second gusset plate extends across a second side segment of the pair of side segments between two opposing contact points of the second side segment.

**6.** The expedition cart according to claim **4**, wherein the pair of side segments are outwardly splayed relative to the pair of horizontal segments.

**7.** The expedition cart according to claim **6**, comprising first and second wheels mounted to the pair of side segments, the first and second wheels being outwardly splayed relative to the pair of horizontal segments.

**8.** The expedition cart according to claim **1**, wherein the first sleeve is fixedly attached to the side mounting surface of the first gusset plate and the second sleeve is fixedly attached to the side mounting surface of the second gusset plate.

**9.** The expedition cart according to claim **1**, wherein the first sleeve is pivotally attached to the side mounting surface of the first gusset plate and the second sleeve is pivotally attached to the side mounting surface of the second gusset plate.

**10.** The expedition cart according to claim **9**, wherein pivoting the first and second sleeves relative to the first and second gusset plates varies an angle of inclination of the first and second shaft arms relative to the first and second gusset plates and the chassis.

**11.** The expedition cart according to claim **9**, wherein each of the first sleeve and the second sleeve comprises a pivot point and a locking mechanism.

**12.** The expedition cart according to claim **9**, wherein the first and second gusset plates comprise a plurality of radially spaced holes, each of the plurality of radially spaced holes being configured and dimensioned to receive a locking mechanism of the first and second sleeves.

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**13.** The expedition cart according to claim **1**, wherein each of the first and second shaft arms comprises a flattened distal portion, the flattened distal portion including a bore extending therethrough.

**14.** The expedition cart according to claim **13**, wherein the flattened distal portion and the bore of each of the first and second shaft arms is configured to interlock relative to an interlocking mechanism of a belt or harness.

**15.** The expedition cart according to claim **1**, wherein each of the first and second shaft arms is at least partially filled with a dampening material to absorb and dampen impact stresses.

**16.** The expedition cart according to claim **1**, wherein each of the first and second shaft arms comprises a bracket near a distal end configured and dimensioned to releasably receive an elongated structure therein, the bracket being in the form of a spring-loaded clip.

**17.** An expedition cart system, comprising:

an expedition cart, the expedition cart including (i) a chassis configured and dimensioned to support a load, (ii) a first gusset plate and a second gusset plate secured to the chassis, each of the first and second gusset plates including side mounting surfaces, and (iii) a first sleeve attached to the side mounting surface of the first gusset plate and a second sleeve attached to the side mounting surface of the second gusset plate, and

a belt or harness, the belt or harness including a pair of interlocking mechanisms,

wherein the first sleeve is configured and dimensioned to releasably receive therein at least a portion of a first shaft arm,

wherein the second sleeve is configured and dimensioned to releasably receive therein at least a portion of a second shaft arm, and

wherein the pair of interlocking mechanisms is configured and dimensioned to releasably interlock the first and second shaft arms therein.

**18.** A method of assembling an expedition cart, comprising:

providing an expedition cart, the expedition cart including

(i) a chassis configured and dimensioned to support a load, (ii) a first gusset plate and a second gusset plate secured to the chassis, each of the first and second gusset plates including side mounting surfaces, and (iii) a first sleeve attached to the side mounting surface of the first gusset plate and a second sleeve attached to the side mounting surface of the second gusset plate,

releasably securing at least a portion of a first shaft arm within the first sleeve, and

releasably securing at least a portion of a second shaft arm within the second sleeve.

**19.** The method according to claim **18**, comprising pivoting the first and second sleeves to vary an angle of inclination of the first and second shaft arms relative to the first and second gusset plates and the chassis.

**20.** An expedition cart, comprising:

a chassis configured and dimensioned to support a load, a first gusset plate and a second gusset plate secured to the chassis, each of the first and second gusset plates including side mounting surfaces, and

a first sleeve attached to the side mounting surface of the first gusset plate and a second sleeve attached to the side mounting surface of the second gusset plate,

wherein the first sleeve is configured and dimensioned to releasably receive therein at least a portion of a first shaft arm,

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wherein the second sleeve is configured and dimensioned to releasably receive therein at least a portion of a second shaft arm, and  
 wherein the first sleeve is pivotally attached to the side mounting surface of the first gusset plate and the second sleeve is pivotally attached to the side mounting surface of the second gusset plate.

21. An expedition cart, comprising:  
 a chassis configured and dimensioned to support a load,  
 a first gusset plate and a second gusset plate secured to the chassis, and  
 a first sleeve mounted to the first gusset plate and a second sleeve mounted to the second gusset plate,  
 wherein the first sleeve is configured and dimensioned to releasably receive therein at least a portion of a first shaft arm,  
 wherein the second sleeve is configured and dimensioned to releasably receive therein at least a portion of a second shaft arm, and  
 wherein each of the first and second shaft arms comprises a bracket disposed near a distal end configured and dimensioned to releasably receive an elongated structure therein such that the elongated structure extends between the first and second shaft arms, each of the brackets includes a first end secured to the respective first and second shaft arms and an opposing second end

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configured to lift up from the respective first and second shaft arms to create an opening for insertion of the elongated structure.

22. An expedition cart, comprising:  
 a chassis configured and dimensioned to support a load, the chassis including first and second side segments on opposing sides of the chassis,  
 a first gusset plate secured to the first side segment of the chassis and a second gusset plate secured to the second side segment of the chassis, the first gusset plate extending across the first side segment between two opposing contact points with the first side segment, the second gusset plate extending across the second side segment between two opposing contact points with the second side segment, and each of the first and second gusset plates including side mounting surfaces, and  
 a first sleeve attached to the side mounting surface of the first gusset plate and a second sleeve attached to the side mounting surface of the second gusset plate,  
 wherein the first sleeve is configured and dimensioned to releasably receive therein at least a portion of a first shaft arm, and  
 wherein the second sleeve is configured and dimensioned to releasably receive therein at least a portion of a second shaft arm.

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